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# Child Maltreatment, Perceived Stress, and Opioid Use in Pregnancy

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To the Graduate Council:

I am submitting herewith a dissertation written by Stephanie Brooke Kors entitled "Child Maltreatment, Perceived Stress, and Opioid Use in Pregnancy." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

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# Child Maltreatment, Perceived Stress, and Opioid Use in Pregnancy

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## Abstract

The current study examined pathways from childhood maltreatment to opioid misuse in pregnancy. We sampled 93 pregnant women at a high-risk pregnancy clinic at a university medical center who were in their second trimester or beyond. 55 women were considered high-risk due to opioid misuse and 38 women were considered high-risk due to medical reasons other than drug use. Results revealed sexual abuse was significantly associated with opioid misuse in pregnancy, while physical abuse, emotional abuse, and neglect were not. Furthermore, women with histories of childhood sexual abuse reported significantly higher levels of perceived stress during pregnancy than women who did not report a history of sexual abuse. However, perceived stress did not moderate the relationship between sexual abuse and opioid misuse. Results suggest adequately screening pregnant women for childhood sexual abuse history as a part of their prenatal care may help alert medical providers as to which women could be at an elevated risk for opioid misuse based on their history of sexual abuse. Integrating trauma-informed care into normal gynecology practice will encourage women with histories of sexual abuse to seek out medical attention rather than to avoid it during their pregnancy.


Key words: opioid misuse, pregnancy, child maltreatment, sexual abuse, stress, substance use

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# CHAPTER I

## Introduction

### The Opioid Misuse Epidemic

Opioid misuse is a growing epidemic in the Unites States (Gottlieb & Woodcock, 2017), with almost 30,000 people dying from opioid overdose in 2014 alone (Rudd, Aleshire, Zibbell, & Matthew Gladden, 2016) compared to approximately 17,000 opioid-related deaths in 2010 (Statistics, 2014). Moreover, approximately 25 million people engaged in opioid use for nonmedical reasons between 2002 and 2011, which ultimately led to almost every state in the country writing legislation to combat this crisis (Dart et al., 2015). Furthermore, in a single year (2014-2015), deaths from opioid overdoses rose from 9.0 per 100,000 to 10.4 per 100,000, which is indicative of an 11.4% increase nationwide (Rudd, 2016). Indeed, drug-use disorders accounted for the largest increase in deaths between 1990 and 2010 (Murray et al., 2013) and opioid use disorder specifically, accounted for 61% of the deaths within this category in 2014 (Rudd, 2016), with more people dying from overdosing on opioids than dying from car accidents (Paulozzi, 2012). In response to these troubling statistics, United States Congress passed the Drug Addiction Treatment Act (DATA, 2000) to allow physicians who meet particular qualifications to treat opioid use disorders with narcotic medications in general medical settings, such as buprenorphine (Zedler et al., 2016). Opioid agonist medication-assisted treatment (MAT), which is considered to be the most effective approach to treating opioid use disorder by the World Health Organization (WHO, 2009), was historically only available through federally regulated opioid treatment programs.

### Opioid Misuse and Pregnancy

One setting which physicians have begun treating opioid use disorders with narcotic medications is in pregnancy clinics. Indeed, the number of women misusing opioids while pregnant has more than quadrupled between 1999 and 2014, increasing from 1.5 per 1,000 delivery hospitalizations to 6.5 per 1,000 delivery hospitalizations, which translates to a

333% increase (Haight, Ko, Tong, Bohm, & Callaghan, 2018). Moreover, in all 28 states which provided data for this study, rates of opioid misuse in pregnancy were increasing in this time period. In the state of Tennessee specifically, where the current study was conducted, opioid misuse in pregnancy increased from 1.19 to 5.77 per 1000 hospital births between 2000 and 2009 (Patrick et al., 2015), and to 11.6 per 1000 hospital births by 2013 (Warren, Miller, Traylor, Bauer, & Patrick, 2015).

Opioid misuse can have devastating consequences not just for the user, but for their offspring as well. The dramatic rise in opioid misuse nationally in pregnant women has led to a 383% increase in Neonatal Opioid Withdrawal Syndrome (NOWS) in offspring between 2000-2012 (Ko, 2016). Between 45-94% of infants exposed to opioids during pregnancy will go on to develop NOWS (Minozzi, Amato, Bellisario, Ferri, & Davoli, 2013), which is a postnatal syndrome associated with autonomic overactivity (e.g. sensory issues), central nervous system irritability (e.g. tremors), and gastrointestinal tract dysfunction (e.g. feeding difficulties; Hudak & Tan, 2012). Infants born with NOWS are more likely to have birth complications including low birthweight, toxemia (Minozzi et al., 2013), respiratory complications (Hudak & Tan, 2012), and decreased head circumference (Towers et al., 2019). Moreover, offspring of women who misuse opioids while pregnant have a 74 fold increase in sudden infant death syndrome (Fajemirokun-Odudeyi et al., 2006; Ludlow, Evans, & Hulse, 2004). Given the serious and sometimes fatal consequences of opioid misuse in pregnancy (Kaltenbach, Berghella, & Finnegan, 1998), it is imperative to seek a deeper understanding of what factors contribute to the risk of opioid misuse in pregnancy so that preventative interventions can target at-risk women before they begin using opioids.

## Psychosocial Risk Factors for Opioid Misuse in Pregnancy

Only one study to date has examined psychosocial factors that precipitate pregnant women beginning to misuse opioids (Towers at al., 2019) . The current study sought to

expand upon Towers et al. (2019), who conducted psychosocial interviews with 192 pregnant women with Opioid Use Disorder (OUD) to ask women what factors they believed precipitated their OUD. They found that the majority of pregnant women misusing opioids (72%) reported a history of abuse, that was most often sexual abuse (53%), for half of whom began before age 13. Physical violence was reported by 18%, while verbal abuse was reported by 4%. Mental illness (e.g. depression, anxiety, or PTSD) was reported by 69-71% of women and family or peer opioid misuse was reported by 78%. Chronic pain, which is often assumed to be the precipitating event to opioid misuse, was only reported by 10%. The current study seeks to expand upon these findings of Towers et al. (2019) by examining self-reported history of child maltreatment in pregnant women who misuse opioids and comparing maltreatment severity (physical abuse, emotional abuse, neglect, and sexual abuse) of women who have a high-risk pregnancy due to medical factors and not including drug misuse. Given Towers et al. (2019) found that sexual abuse was the most often cited adverse childhood experience for pregnant women prior to begin misusing opioids, we aimed to examine sexual abuse, in particular, more closely, to investigate whether perceived stress acts as a moderator in the relationship between sexual abuse and opioid misuse.

## Theoretical Background

The self-medication hypothesis argues that an addict's choice of substance is not arbitrary. Rather, an individual finds a drug which meets their own psychological need to alleviate emotional distress (Khantzian, 1987). Thus, the hypothesis suggests that drug use disorders stem originally from an inability to regulate negative emotions in times of stress (Khantzian, 2015). Experiencing any subtype of child maltreatment is theorized to inhibit the development of adequate self-regulation capacities to manage stress, which subsequently weaves through an individuals' pattern of experiencing emotions (Khantzian, 2015). Moreover, it has been theorized that drug users fail to successfully internalize parenting or

soothing functions, which subsequently inhibits their ability to regulate their emotions later in life (Wieder & Kaplan, 1969).

Although any woman who has been maltreated (e.g. physical abuse, emotional abuse, and neglect) as a child may be at risk for misusing opioids to self-soothe during times of stress, women with sexual abuse histories who are faced with the stress of pregnancy may be at a particularly increased risk for misusing a drug like opioids, which create a soothing effect on its' users. As such, those with sexual abuse histories may utilize less effective coping strategies like drug use, during a time which reminds them of their abuse (i.e. pregnancy) than those without sexual abuse histories, in an effort to protect themselves from emotionally deteriorating in this stressful time (Callahan & Hilsenroth, 2005). From an object relations perspective, opioids, which decrease physiological arousal, might then provide that soothing presence needed to adequately cope with stress which the individual cannot find elsewhere (Wieder & Kaplan, 1969). Women with sexual abuse histories, who are then faced with stressful life events like pregnancy, which often triggers memories of sexual abuse, might then subsequently become addicted to the substance that helps them to bear overwhelming affect associated with these experiences (Khantzian et al., 2005; Khantzian, 1987; Wieder & Kaplan, 1969). In the current study, we expected that women who report any subtype of maltreatment (physical abuse, sexual abuse, neglect, emotional abuse) would be more likely to misuse opioids than those who do not report these maltreatment subtypes, but that sexual abuse would be most strongly associated with opioid misuse in pregnancy compared to the other subtypes.

Empirical Literature on Child Maltreatment and Opioid Misuse

Individuals who report child maltreatment histories are more likely than those without maltreatment histories to engage in misuse of opiates (Heffernan et al. 2000). Heffernan et al. (2000) found that sexual abuse alone accounted for 8.8% of those reporting maltreatment,

while sexual abuse or physical abuse accounted for 27% and physical abuse alone accounted for 24.1%. Opioid users, regardless of gender, were 2.7 times more likely to report a history of sexual/physical abuse or physical abuse alone. While these findings are significant, they are limited by the inclusion of only two subtypes of maltreatment: physical abuse and sexual abuse. Mills found that 52% of an opioid-using sample reported histories of sexual abuse (Mills, Lynskey, Teesson, Ross, & Darke, 2005), though their findings are limited by not having included a control group. The current study sought to address the limitations of previous studies by adding a control of non-opioid users and also investigating emotional abuse and neglect, particularly within a population of pregnant woman. We expected to replicate these findings, such that opioid-misusing women would report significantly more child maltreatment in all subtypes than the control group. Though neglect has not yet been studied in a population of opioid-misusing pregnant women, previous research in general opioid-misuse groups have found high rates of both emotional and physical neglect (Conroy, Degenhardt, Mattick, & Nelson, 2009), so we expected to have similar findings in this regard. In the current study, we therefore expected to find that pregnant women misusing opioids would report more child maltreatment than pregnant women who are not misusing opioids in each maltreatment subtype (physical abuse, sexual abuse, neglect, emotional abuse).

Gender Differences for Child Maltreatment History Reported by Opioid Users

While child maltreatment is a risk factor for opioid misuse in both men and women, research has found gender differences with regard to maltreatment subtype associated with opioid misuse. Men who misuse opioids report higher rates of physical and emotional abuse, while women who misuse opioids report higher rates and severity of sexual abuse (Conroy et al., 2009). Such findings highlight sexual abuse as a particular risk factor for opioid misuse among women. In that sample, 72% of opioid users were female while only 36% of opioid users were male (Conroy et al., 2009). Findings from Conroy et al. (2009) are limited by their

control group, which also had a history of opioid misuse, though they had not sought treatment for such use. The current study sought to address these limitations by utilizing a control group which reports no opioid use, past or present.

Indeed, women with histories of sexual abuse are more likely to report psychological reasons for why they began using drugs than women without sexual abuse histories (Bartholomew, Courtney, Rowan-Szal, & Simpson, 2005; Bartholomew, Rowan-Szal, Chatham, Nucatola, & Simpson, 2002). Furthermore, women with trauma histories have a higher risk for opioid misuse then men with trauma histories (Meier et al., 2014). Given that approximately 21,000 women between the ages of 15 and 44 misuse opioids while pregnant each month in the United States alone (Smith & Lipari, 2017), it is particularly important to understand underlying pathways from sexual abuse to opioid use in this population to reduce the devastating consequences opioid use can have on developing fetuses. While we expected to find more physical abuse, sexual abuse, neglect, and emotional abuse in women who are misusing opioids while pregnant, we expected that sexual abuse would be most strongly associated with opioid misuse compared to the other subtypes.

Empirical Literature on the Developmental Consequences of Child Maltreatment

McLaughlin, Sheridan, & Lambert (2014) propose different subtypes of maltreatment (i.e. sexual abuse versus neglect versus physical abuse) may lead to distinct outcomes. For instance, they theorize that abuse interferes most with emotional and social processing, while neglect seems to most disrupt cognitive development. Out of all forms of child maltreatment, sexual abuse has been found to be the most highly associated with low mental well-being in adulthood (Hughes, Lowey, Quigg, & Bellis, 2016) and the most costly medical care (Walker et al., 1999). With this in mind, we planned to investigate the unique sequalae of sexual abuse as it relates to the development of opioid use in pregnant women specifically. Moreover, given the severity of psychosocial outcomes of sexual abuse has been associated with the

severity of the abuse (Bagley & Ramsay, 1986), we plan to investigate how severity relates to opioid use in pregnancy in the current study. Measuring maltreatment in two ways (presence/absence and severity) allowed us to gain a deeper understanding of the differential consequences of child maltreatment with regard to opioid misuse in pregnancy and the extent to which the nature of the abuse or neglect impacts the likelihood of opioid misuse in pregnancy.

Empirical Literature on the Relationship between Sexual Abuse and Stress

Research consistently suggests that sexual abuse increases one's sensitivity to stress later in life (Kendall-Tackett, 2002; King, Mandansky, King, Fletcher, & Brewer, 2001) through dysregulation of both the hypothalamic-pituitary-adrenal axis and the endogenous opioid system (Charney, Deutch, Krystal, Southwick, & Davis, 1993; Cohen, Pickar, & Dubois, 1983; Davis & Siegel, 2000; Kosten & Krystal, 1988; Van der Kolk, McFarlane, & Weisæth, 2012). Dysregulation of the hypothalamic-pituitary-adrenal axis results in the production of abnormally high or low cortisol (Altemus, Cloitre, & Dhabhar, 2003; Heim & Nemeroff, 2002) which subsequently impairs the stress response throughout life (McEwen, 2000; Sanchez, Ladd, & Plotsky, 2001), potentially putting these individuals at a higher risk for heightened emotional reactions to stress. Indeed, individuals with histories of sexual abuse experience significantly higher rates of stress-related diseases (Felitti et al., 2019; Stein & Barrett-Connor, 2000; Walker, Katon, Roy-Byrne, Jemelka, & Russo, 1993).

However, not all women who experience sexual abuse go on to develop difficulties regulating stress (Draucker, 1995; Folger et al., 2017; Harvey, 1996; Neiman, 1988; Romans, Martin, Anderson, O'Shea, & Mullen, 1995): 21% to 49% of children who experience sexual abuse do not develop any symptoms (Kendall-Tackett, Williams, & Finkelhor, 1993; McLeer, Deblinger, Henry, & Orvaschel, 1992) and 22% of adult survivors of sexual abuse exhibit no symptoms (Russell & Russell, 1986). It is therefore possible that women with

histories of sexual abuse, who go on to develop a *heightened* stress response, may subsequently experience greater levels of perceived stress in pregnancy when traumatic memories of their abuse is triggered, and thus be at an increased risk for opioid misuse to manage that stress. In the current study, we therefore expected to find that perceived stress will moderate the relationship between sexual abuse and opioid misuse in pregnancy.

Empirical Literature on Sexual Abuse, Perceived Stress, and Pregnancy

Because pregnancy is naturally a stressful life event for most women (Geller, 2004), particularly for those with sexual abuse histories (Leeners, Richter-Appelt, Imthurn, & Rath, 2006) and for those with high-risk pregnancies (Wang et al., 2019), we sought to investigate sexual abuse, specifically, more closely. Indeed, women with sexual abuse histories experience significantly more difficult pregnancies than those without sexual abuse histories, including increased discomfort and health complaints, higher nonscheduled contact with their medical provider, and a higher number of ultrasound examinations (Littleton, 2015; Lukasse, Schei, Vangen, & Øian, 2009). Women with histories of childhood sexual abuse do indeed report increased levels of stress during pregnancy, with many stages of pregnancy, prenatal care, and delivery being complicated by memories of sexual abuse (Jacobs, 1992). Indeed, pregnancy has been theorized to function as a re-traumatization of sexual abuse which occurred in childhood (Lev-Wiesel, Daphna-Tekoah, & Hallak, 2009). The current study sought to fill this gap in the literature by examining whether pregnant women with sexual abuse histories report more perceived stress and examining whether perceived stress may play a role in the potential relationship between sexual abuse and opioid misuse in pregnancy. We expected that perceived stress would moderate the relationship between child sexual abuse and opioid misuse in pregnancy.

## Empirical Literature on the Relationship between Perceived Stress and Opioid Misuse

Past research suggests a relationship between the endogenous opiate system and the experience of trauma (Cohen et al., 1983). Opioids inhibit the locus coeruleus, which has been implicated in stress reaction (Kosten & Krystal, 1988). Indeed, researchers have subsequently theorized that opioid users, in particular, may utilize opioids as a means of self-medication due to the analgesic properties of opioids which can ease symptoms of hyperarousal associated with the experience of stress (Bremner et al., 1994; Charney et al., 1993; Kosten & Krystal, 1998). Indeed, past research proposes that opioids may *numb* intense emotional pain, which would normally disorganize an individual with a limited ability to self-regulate (Blatt, Rounsaville, Eyre, & Wilber, 1984; Khantzian, Mack, & Schatzberg, 1974; Kosten & Krystal, 1988). Previous research has also found gender differences in opioid use, such that the risk for co-occurring PTSD symptoms and opioid misuse were approximately 3 times greater for women versus men (Meier et al., 2014). Thus, it is possible that child maltreatment and perceived stress interact to produce an increased risk for opioid use in women.

## Empirical Literature on Sexual abuse, Pregnancy, and Opioid Use

There has been only one study to date investigating the relationship between sexual abuse and opioid misuse in pregnancy (Towers et al., 2019). While they found strikingly high rates of childhood adversity, particularly with regard to sexual abuse, their findings are also limited by a lack of control group and by an interview method that did not cover all subtypes and dimensions of maltreatment. In the current study, we sought to build on these findings by utilizing a larger sample size and implementing a quantitative design, which includes a control group of women without opioid misuse who also have high-risk pregnancies, and a valid questionnaire about childhood maltreatment. Given both studies found sexual abuse to be most prevalent in their samples of opioid-misusing pregnant women, we expected that

sexual abuse would be most strongly associated with opioid use in pregnancy compared to the other maltreatment subtypes.

**Hypotheses**

1. (a) There will be significantly more child maltreatment (presence/absence; sexual abuse, physical abuse, emotional abuse, neglect) observed in the opioid group than the non-opioid group and (b) there will be significantly more child maltreatment (severity; sexual abuse, physical abuse, emotional abuse, neglect) observed in the opioid group than the non-opioid group.
2. (a) Presence of sexual abuse will be most strongly associated with opioid misuse in pregnancy compared to the other maltreatment subtypes (presence/absence of physical abuse, emotional abuse, emotional neglect, physical neglect) and (b) Severity of sexual abuse, duration of sexual abuse, and age of the onset of sexual abuse will be associated with opioid misuse in pregnancy, such that women who experienced more severe, longer-lasting and earlier onset sexual abuse will be more likely to misuse opioids in pregnancy than women who experienced less severe, shorter duration, or later age onset of sexual abuse.
3. (a) Women who report histories of sexual abuse (presence/absence) will report higher levels of perceived stress than women who do not report histories of sexual abuse and (b) women who report more severe sexual abuse (severity) will report higher levels of perceived stress than women who report less severe sexual abuse.
4. The effects of sexual abuse (severity) on opioid misuse (presence/absence) will be moderated by perceived stress, such that women who report experiencing sexual abuse and high levels of perceived stress will be more likely to misuse opioids in pregnancy than women who report experiencing sexual abuse but did not experience high levels of perceived stress.

# Chapter II

# Method

## Procedures

**High-Risk Pregnancy Appointment.** Participants were recruited from a High-Risk Pregnancy Clinic at a University Medical Center in the Southeastern United States, which sees patients from both urban and rural areas. Any pregnant woman being seen at the clinic was eligible to participate in the study if they were over the age of 18 years old and were at least in their second trimester of their pregnancy. Women were asked by the receptionist at check-in whether they would be interested in participating in a 30-minute study on high-risk pregnancy. If they expressed interest in participating in the study, they were escorted by a nurse to a private examination room to meet with a research assistant. At this time, the research assistant explained the purpose of the study, what would be required of the participant, answered any questions the participant had, and obtained informed consent, Consent included willingness to participate in the study, complete questionnaires and to allow the research assistants access to their medical charts for additional information (i.e. urinalysis results, demographics etc.). They received a $25 gift certificate to Walmart as compensation for the time required to take part in the study.

## Participants

Ninety-three women participated in the current study. Fifty-five women were high-risk due to opioid misuse disorder and thirty-eight were high risk due to medical factors (not drug use), such as multiples in pregnancy, morbid obesity (body mass index > 50), cardiovascular, cardiopulmonary, or rheumatologic diseases. Women were initially referred to the high-risk pregnancy clinic by their primary care physicians. Women in both groups were seen at the high-risk pregnancy clinic approximately monthly until 28 weeks gestation, biweekly until 36 weeks gestation, and weekly from 36 weeks gestation until delivery.

**Demographics.** Demographic information was obtained from participants' medical records. See Table 1.

## Measures

**Maltreatment.** Child maltreatment subtypes and dimensions were measured with the Maltreatment and Abuse Chronology of Exposure (MACE; Teicher & Parigger, 2015), which is 52-item questionnaire that assesses child maltreatment severity along continuous scales which provide information regarding when and for how long an individual experienced maltreatment and how severe the maltreatment was. Subscales for each maltreatment subtype were made up of yes/no questions. The subtypes of maltreatment used in the current study are sexual abuse, physical abuse, emotional abuse and neglect. Severity of each subtype is calculated either by the total number of items endorsed, which is recalibrated to a total severity level between 0-10 (if there were at least five) or were rescored based on linear interpolation of items endorsed (if there were less than five). The MACE has been validated using other measures of childhood trauma (Child Trauma Questionnaire, CTQ; Bernstein et al., 1994), Adverse Childhood Experiences, (ACE; Dube et al., 2003) and accounted for more variance in psychiatric symptoms than did the ACE or CTQ. The MACE was developed using item response theory and provides excellent reliability utilizing the Andersen's Likelihoood ratio test (Teicher & Parigger, 2015). In the current study, we used presence/absence of each maltreatment subtype and severity of sexual abuse (7 items), physical abuse (6 items), emotional abuse (10 items), emotional neglect (5 items) physical neglect (5 items). In addition to a continuous severity rating, we also plan to assess presence/absence with a categorical variable. Presence of a maltreatment subtype will be coded (1) if the participant endorses any of the items pertaining to this subtype, regardless of severity.

**Opioid Use.** Participants were assigned to the opioid group based on medical records of urine-based assays conducted by their medical provider at their medical appointments. Specifically, we utilized a dichotomous variable (yes/no) based on the participants' urine sample taken within 30 days prior to taking part in the study. Women will be assigned to the opioid group if either prescribed (e.g., methadone or buprenorphine) or non-prescribed opioids are detected. Each participant had at least one urine sample within 30 days prior to participating in the study. For the purposes of the current study, we were specifically interested in examining opioid use. For this reason, women who tested positive for drugs other than opioids (e.g. marijuana, alcohol, cocaine, or stimulants) were excluded from our sample if they were not also misusing opioids. In the current sample, there are 55 participants in the opioid group and 38 participants in the comparison group.

**Perceived Stress.** Perceived stress was measured through the stress subscale of the Depression, Anxiety, and Stress Scale (DASS-21; Lovibond & Lovibond, 1995), which consists of 21 items derived from the original 42-item DASS long-form. The stress subscale seeks to measure overall emotional response to stressors. Items seek to examine levels of irritability, agitation, impatience, and general tension. The DASS asks individuals to indicate the extent to which they experience these feelings on a 4-point scale, which range from 0, indicating the statement does not apply to them at all, to 3, indicating the statement applies to them "very much or most of the time." The score for the stress subscale is obtained by totaling all items in the scale and multiplying the total sum by two (to double it), which matches the scoring for the long form of the DASS-42 (Lovibond & Lovibond, 1995). A higher score indicates a higher level of perceived stress. The DASS-21 has been demonstrated to have adequate internal consistency and convergent validity across various populations (Antony, Bieling, Cox, Enns, & Swinson, 1998; Clara, Cox, & Enns, 2001). In the current sample, the Cronbach's alpha for the stress subscale was $\alpha = .80$.

# Chapter III

## Results

### Preliminary analyses

Preliminary analyses revealed differences between groups on age and minority ethnic background, such that women who used opioids during pregnancy were more likely to be older and less likely to be from an ethnic minority background than those in the comparison group. Age and ethnic minority background was controlled for in the analyses. See Table 1 for group differences on demographic variables.

To test our hypothesis 1(a), we conducted 5 logistic regressions to determine if child maltreatment (sexual abuse, physical abuse, emotional abuse, and neglect) would be associated with more opioid misuse in pregnancy. The categorical variable of child maltreatment (presence/absence) served as the independent variable and opioid misuse served as the dependent variable. Age and ethnic minority background were entered in step 1. Child maltreatment subtype (i.e. sexual abuse, physical abuse, emotional abuse, neglect) was entered in step 2.

Logistic regression analyses revealed presence of maternal sexual abuse was significantly associated with opioid misuse in pregnancy ($p < .05$). However, maternal physical abuse, emotional abuse, and neglect were not significantly associated with opioid misuse in pregnancy. See Table 2.

To test our hypothesis 1(b), that the severity of child maltreatment (sexual abuse, physical abuse, emotional abuse, and neglect) would be associated with more opioid misuse in pregnancy, we conducted 5 binary logistic regressions. The severity variable of child maltreatment (severity rating) served as the independent variable and opioid misuse served as the dependent variable. Age and ethnic minority background were entered in step 1. Child

maltreatment subtype (i.e. sexual abuse, physical abuse, emotional abuse, neglect) was entered in step 2.

Logistic regression analyses revealed severity of maternal sexual abuse as marginally significant in be associated with opioid misuse in pregnancy ($p = .06$). However, maternal physical abuse, emotional abuse, and neglect were not significantly associated with opioid misuse in pregnancy. See Table 3.

To test hypothesis 2(a), that the presence of sexual abuse would be most strongly associated with opioid misuse in pregnancy compared to the presence of other maltreatment subtypes (physical abuse, emotional abuse, and neglect), we conducted a binary logistic regression. Presence/absence of sexual abuse served as the independent variable and opioid misuse in pregnancy served as the dependent variable. Presence/absence of age, ethnic minority background, physical abuse, emotional abuse, and neglect were entered in step 1. Presence/absence of sexual abuse was entered in step 2. Logistic regression analyses revealed presence of sexual abuse was most strongly associated with opioid misuse compared to the presence of physical abuse, emotional abuse, and neglect ($p < .05$). See Table 4.

To test hypothesis 2(b), that severity of sexual abuse would be most strongly associated with opioid misuse in pregnancy compared to the severity of other maltreatment subtypes, we conducted a binary logistic regression. Sexual abuse severity served as the independent variable and opioid misuse in pregnancy served as the dependent variable. Age, ethnic minority background, and severity of physical abuse, emotional abuse, and neglect were entered in step 1. Presence/absence of sexual abuse was entered into step 2. Logistic regression analyses revealed severity of sexual abuse was most strongly associated with opioid misuse compared to the severity of physical abuse, emotional abuse, and neglect ( $p = .07$). See Table 5.

To test hypothesis 3, that women who report histories of sexual abuse (presence/absence) would report higher levels of perceived stress than women who do not report histories of sexual abuse, we conducted an ANOVA. Sexual abuse (absence/presence) served as the independent variable and perceived stress served as the dependent variable. Age and ethnic minority status were entered as covariates. Analyses revealed maternal sexual abuse was significantly associated with maternal perceived stress $F\ (1, 93) = 3.29, p < .05$.

To test hypothesis 4, that the effects of sexual abuse (presence/absence) on opioid misuse would be moderated by perceived stress, we conducted a binary logistic regression. Sexual abuse and stress served as the independent variables. Opioid misuse served as the dependent variable. For step 1, we entered age, ethnic minority background, sexual abuse and stress as the covariates. For step 2, we entered the interaction term, which was presence/absence of sexual abuse X stress. Analyses revealed maternal perceived stress did not moderate the relationship between sexual abuse and opioid misuse ($p = .26$). See Table 6.

# Chapter V

# Discussion

## Summary of Findings

The current study is the first to find that women with histories of childhood sexual abuse are more likely to misuse opioids than women without such histories. We specifically found that the presence of sexual abuse was significantly associated with opioid misuse in pregnancy, while presence of physical abuse, emotional abuse, and neglect was not. Furthermore, we also found that the severity of sexual abuse was marginally significantly associated with opioid misuse in pregnancy, while physical abuse, emotional abuse, and neglect severity were not. Moreover, the presence of sexual abuse was significantly associated with opioid misuse above and beyond presence of the other maltreatment subtypes. Additionally, the severity of sexual abuse was marginally significantly associated with opioid misuse above and beyond severity of other maltreatment subtypes. Lastly, women who reported sexual abuse histories also reported higher levels of perceived stress than women who did not report such histories, but perceived stress did not moderate the relationship between sexual abuse and opioid misuse.

## Sexual Abuse and Opioid Misuse

Our finding that sexual abuse was associated with opioid misuse in pregnancy is consistent with findings from Towers et al. (2019) who found that opioid-misusing pregnant women reported histories of sexual abuse more often than any other kind of child maltreatment. Furthermore, our study built upon these findings by adding a high-risk control group and an empirically-supported measure of maltreatment rather than depending on interview methodology. However, our findings did not support previous research which found that opioid users were more likely to report a history of physical abuse than non-opioid users (Heffernan et al., 2000). In the current sample, only sexual abuse was associated with

opioid misuse in pregnancy. Physical abuse, emotional abuse, and neglect were not. It is important to note that Heffernan et al. (2000) examined both men and women in their sample. Previous research has found gender differences such that men who misuse opioids report elevated rates of physical and emotional abuse, while women who misuse opioids report elevated rates of sexual abuse (Conroy et al., 2009). Such gender differences might explain why our results differ from Heffernan et al. (2000), but are consistent with previous research specifically on pregnant women.

### Sexual Abuse, Perceived Stress, and Opioid Misuse

Contrary to our hypothesis, perceived stress did not moderate the relationship between sexual abuse and opioid misuse. Our findings suggest that sexual abuse was associated with opioid misuse but that the likelihood of subsequent opioid misuse following sexual abuse does not differ based on level of perceived stress reported during pregnancy. Moreover, experiencing sexual abuse alone, regardless of a woman's level of perceived stress, significantly increased the likelihood of opioid misuse. Such findings support the need to identify patients with sexual abuse history before they become pregnant to avoid the development of opioid misuse. One way to identify these patients would be through screening for Adverse Childhood Experiences (ACEs) in medical visits. Identifying patients with histories of adverse childhood experiences as children that include sexual abuse would increase access to preventative treatment for these patients before they become mothers themselves.

### Screening for (ACEs) in Pediatrician Visits

One way to do this would be to screen for sexual abuse in Primary Care visits in childhood. Despite a strong link between adverse childhood experiences and long-lasting health problems in adulthood (Hughes, Lowey, Quigg, & Bellis, 2016), this is not standard practice. Indeed, only 4% of pediatricians report asking about all adverse childhood

experiences and 32% report not asking about any adverse childhood experiences. For those who do report asking about ACEs, they generally only ask about family history of mental illness and whether a child's parents have divorced or separated (Kerker et al., 2016). The majority of physicians do not ask about sexual abuse, physical abuse, or neglect.

One reason medical providers may not ask about ACEs during their visits is lack of familiarity with ACEs and their impact on physical health. Kerker et al. (2016) found that only 2% of pediatricians reported being "very familiar" with the ACEs study and 76% of pediatrics reported that they were not at all familiar with the study. Furthermore, 79% of physicians felt that asking about socio-emotional stressors within a family were outside the scope of their job. This is particularly troubling given the strong bidirectional relationship with psychological and physical health (Dube et al., 2003). While most pediatricians report feeling as though inquiring about ACEs is outside their scope of practice, research has found parents strongly support pediatricians screening for ACEs during their primary care visits (Conn et al., 2018). With this in mind, it is also possible that pediatricians realize that should a child answer "yes" to questions regarding ongoing trauma, they would need to contact Child Protective Services, which could create a rupture in the trusting relationship between parent and provider. Furthermore, pediatricians may worry their involvement with DCS could then cause a parent to stop seeking medical care for their child.

Screening for ACEs in Adult Primary Care Visits

While screening for intimate partner violence is much more common place (Women, Yawn, Yawn, & Uden, 1992), screening for child maltreatment histories among adult primary care patients is also quite uncommon. Despite 20-50% of adult patients reporting history of child sexual, physical, or emotional abuse, 25% of adult primary care providers report they rarely or never screen adult patients for child maltreatment history (Weinreb et al., 2010). Moreover, adult primary care physicians report similar feelings regarding

screening for ACEs as do pediatricians; one study found that approximately two-thirds of adult primary care physicians did not believe that they should routinely screen for childhood sexual abuse. Less than one third of primary care physicians report screening female patients for child maltreatment and about one in eight physicians report screening male patients for child maltreatment. Such beliefs subsequently impact the rate of those who do screen for such histories (Richardson et al., 2001). Indeed, Richardson et al. (2001) found that only one in one hundred physicians screened for such a history. Of note, mandatory reporting laws are quite different for adults reporting pervious histories of trauma. If providers began regularly inquiring about ACEs among patients, they could begin to make psychotherapy referrals so these patients, child and adult, could receive adequate treatment. Doing so would likely improve their physical health as well.

Screening for ACEs in Gynecologist Visits

We know that sexual abuse also predicts health outcomes specific to pregnant women, such as obstetric problems, challenges with breastfeeding, and adverse outcomes for their infants (Leeners, Richter-Appelt, Imthurn, & Rath, 2006). Moreover, women with sexual abuse histories are more likely to avoid certain routine gynecological procedures, even outside of exams related to pregnancy, such as Pap smears and mammograms (Farley, Golding, & Minkoff, 2002). Screening pregnant women for childhood sexual abuse history as a part of their prenatal care may help alert medical providers as to which women could be at an elevated risk for opioid misuse based on their history of sexual abuse. Furthermore, screenings may also allow gynecologists to provide emotional support, psychoeducation, and referrals for psychotherapy, thus decreasing the risk of opioid misuse in pregnancy (American Academy of Pediatrics, 2014). Moreover, knowledge of sexual abuse history may also enable gynecologists to practice more trauma-informed care. For instance, providing a patient a sense of safety and control by requesting permission to touch a patient and allowing

them to stop the procedure when they feel uncomfortable can minimize the risk of retraumatizing a patient with such a history (Havig, 2008). Implementing these practices in medical disciplines beyond gynecology, where patients with sexual abuse histories are likely to feel the most anxiety, would likely improve the encourage these patients to seek regular medical care, provide them more pathways to access proper psychotherapy treatment, and improve provider-patient relationships and related outcomes.

### Implications for Patient Care

Gynecologists can then draw associations between current difficulty with medical care which may bring up memories of past sexual abuse (McKegney, 1993). Doing so may encourage patients with histories of sexual abuse to seek out medical attention rather than to avoid it. Indeed, psychological insight regarding behavioral symptoms underlies many of the major types of empirically-supported psychotherapy (Connolly Gibbons, Crits-Christoph, Barber, & Schamberger, 2007). Such insight would likely be useful for both the patient and the physician. Indeed, reflective functioning, the ability to interpret underlying emotional states, has been found to mediate the relationship between childhood sexual abuse and opioid misuse severity in pregnancy (Macfie et al., 2020). Havig (2008) notes that trauma survivors may be labeled as "difficult" by providers when their trauma history interrupts the patient-provider relationship. Such labels, and resulting attitudes from providers, may subsequently lead to the patient feeling revictimized and stigmatized once again (Roberts, 1996). As a result, feelings of victimization may then lead the patient to avoid medical care all together or to resort to substances to numb the psychological pain.

### Empirical Literature on Perceived Stress, Income, and Opioid Misuse

Our findings must be conceptualized within the broader context of how opioid addiction became the devastating epidemic that it is today. Prior to the 1990s, opioid prescription for pain was not widespread. Relatedly, nor was opioid use for psychological

pain. Around this time, researchers began to argue that opioids could be utilized more long-term, citing their addictive potential to be quite low (Portenoy & Foley, 1986; Zenz et al., 1992). The pharmaceutical industry was then able to promote opioid prescription to medical providers unfamiliar with the addictive potential of such drugs. Indeed, it has been theorized that in a society exhibiting a marked intolerance of both physical pain, and *emotional* pain, the profits of opioid prescription may have outweighed the risk of addiction, and death (deShazo, Johnson, Eriator, & Rodenmeyer, 2018). As Sir Angus Deaton noted in his testimony on the economic aspects of the opioid crisis to the United States Congress, "Selling heroin is profitable and illegal. Selling prescription drugs is profitable and legal" (Deaton, 2017). Providers began to prescribe opioids more and more frequently (Zhou et al., 2016) and ultimately the American Pain Society and the American Academy of Pain Medicine stated their support for opioid use as a treatment for chronic pain (Haddox et al., 1997). Subsequently, we saw a significant increase in opioid use, with approximately 25 million Americans misusing the drug between 2002 and 2011 (SAMHSA, 2012).

Such an increase disproportionally impacted the Appalachian region of the United States, where there are significant differences in employment, education, and socio-economic status compared to the rest of the country. Moreover, recent data suggest the higher mortality rate found among Appalachia, where the current study was conducted, is in large part due to "diseases of despair," such as alcohol abuse, illicit drug use, prescription drug use, and suicide which correspond with such disparities (Meit, Heffernan, Tanebaum, Hoffmann, 2017).

Socio-Economic Status and Opioid Use

While physicians have begun prescribing opioids less often in general (IQVIA, 2018), opioids are prescribed more often to patients who come from low socioeconomic backgrounds than to patients who come from more economically advantaged backgrounds

(Grol-Prokopczyk, 2019). While a significant portion of opioid use is illicit, increased prescriptions increase the amount of opioids sold illegally, particularly in economically disadvantaged communities. Given we know that childhood maltreatment and poverty are strongly associated (Kim & Drake, 2018) and that poverty is related to stress (Marmot & Wilkinson, 2005), those who are at the greatest risk for opioid misuse may be the very patients which medical providers are most likely to prescribe opioids to. While there are many alternatives to opioid prescription (White, 2017), more socioeconomically disadvantaged patients may not have adequate health insurance to cover such treatments (Grol-Prokopczyk, 2019). As such, medical providers may be more likely to prescribe opioids to low-income populations which could not afford out-of-pocket costs for alternative treatment methods. In the current sample, all participants received Medicare. Future research should examine how frequency and severity of opioid misuse during pregnancy differs based on socio-economic status. Furthermore, it is possible that financial stability is associated with other protective factors which promote resilience among childhood sexual abuse victims. With this in mind, it is possible that poverty could partially mediate the relationship between childhood sexual abuse and opioid misuse in pregnancy.

Strengths and Limitations

This is the first study to utilize a control group of any kind to compare child maltreatment histories of opioid misusing and non-opioid misusing pregnant women. We built upon the findings of Towers et al. (2019) by using an empirically validated measure of maltreatment rather an unstructured interview to gather maltreatment data. Moreover, our use of both categorical and continuous measures of maltreatment allowed us to consider the impact of the severity of such maltreatment on opioid misuse in pregnancy. Examining maltreatment in this way enabled us to further understand whether it is merely the presence of the maltreatment which puts women at a greater risk of opioid misuse or if the severity of the

maltreatment is what puts women at a greater risk. Indeed, severity of psychosocial outcomes of sexual abuse has been associated with the severity of the abuse (Bagley & Ramsay, 1986).

One limitation of the current study was that we did not consider age of onset of sexual abuse, which has also been associated with severity of psychosocial outcome (Bagley & Ramsay, 1986; Sedney & Brooks, 1984; Sirles, Smith, & Kusama, 1989). Future research should aim to examine if the age at which sexual abuse begins relates to the likelihood of opioid misuse occurring in pregnancy. We also only gathered retrospective data, so it is possible not all sexual abuse was reported. Indeed, research has found that not all sexual abuse is remembered (Brown, Schelfin, & Whitfield, 1999). We also did not consider the severity of the opioid misuse, which could be related to sexual abuse severity as well. Future research should also consider frequency and quantity of opioid consumption as it relates to childhood sexual abuse. Furthermore, we did not gather data regarding whether these women were first time mothers. It is possible that women who had previously had a pregnancy would exhibit lower, or higher levels of stress as a result.

Moreover, all participants in our sample were considered low socio-economic status. Although Medicaid coverage is be associated with increased likelihood of misusing opioids, opioid misuse impacts women from all socio-economic backgrounds (Grol-Prokopcyzk, 2018; Frenk et al., 2015). With this in mind, it will be important for future research to survey women from higher socio-economic backgrounds as well. In the current study, our sample was relatively homogeneous with regard to racial identity, with most of our participants identifying as Caucasian. Future research should aim to survey a diverse group of women to examine whether our findings generalize to other racial groups. We also unexpectedly found that age was a strong predictor of opioid misuse, such that women who are older are more likely to misuse opioids during pregnancy compared to women who are younger. It is possible that older women in our sample had dealt with such trauma for longer without

adequate psychotherapeutic intervention and thus were at an increased risk for opioid misuse. It is also possible that older women in our sample that experienced previous pregnancies which made the current pregnancy more stressful, thus increasing their risk for self-medicating with opioids. Future research should examine factors which might increase risk for opioid misuse based on age.

Implications of the current study are limited due to the cross-sectional design. For instance, measuring perceived stress before, during and after pregnancy and duration and severity of opioid misuse during, before, and after pregnancy would allow us to better understand the timeline of their symptoms. It is possible that women abusing opioids were more stressed during pregnancy due to the potential harm their drug use might be causing their baby in utero and not because they were more stressed prior to beginning to use opioids. Likewise, it is also possible that some women began using opioid before their pregnancy began and some began using opioids while pregnant. It will be important in future research to distinguish any differences between these two groups.

## Conclusion

Opioid misuse creates unique challenges for pregnant women, their providers, and their unborn offspring. Women who experienced sexual abuse as children are more likely to avoid gynecological procedures. Furthermore, despite women reporting they prefer physicians to ask about trauma history, most physicians feel ill-prepared to inquire about a patient's ACEs during medical appointments and many feel it is beyond the scope of their job. Adequately screening pregnant women for childhood sexual abuse history as a part of their prenatal care may help alert medical providers as to which women could be at an elevated risk for opioid misuse based on their history of sexual abuse. Given that sexual abuse history substantially increases the likelihood of opioid misuse in pregnancy, it is crucial for medical providers to integrate trauma-informed care into normal gynecology

practice. Doing so will encourage women with histories of sexual abuse to seek out medical attention rather than to avoid it during their pregnancy.

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# Appendices

Table 1. *Demographics and Gestation Differences between Opioid and High-Risk Medical Comparison groups*

| Variables | Overall Sample *(N=93)* | Opioid (*n* = 55) | Comparison (*n* = 38) | Opioid vs. Comparison |
|---|---|---|---|---|
| Variable | *M (SD)* | *M(SD)* | *M(SD)* | *t* |
| Age | 27.2 (4.3) | 28.2 (4.4) | 25.7 (3.6) | 2.94* |
| Gestation | 26.8 (7.9) | 27.6 (7.9) | 25.7 (7.9) | 1.08 |
| | *%* | *%* | *%* | $\chi^2$ |
| Minority Ethnic Background | 16 | 7 | 29 | 7.81* |
| Employed | 17 | 15 | 21 | 0.69 |
| Has Partner | 38 | 36 | 39 | 0.09 |
| Medicaid | 100 | 100 | 100 | 0.00 |

*$p < .05$

Table 2. *Presence of Maltreatment and Opioid Misuse*

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Physical abuse | .19 | .54 | .12 | 1 | .73 | 1.21 |
| Neglect | .22 | .28 | .60 | 1 | .44 | 1.24 |
| Sexual abuse | 1.16 | .53 | 4.75 | 1 | .03* | 3.17 |
| Emotional abuse | .10 | .28 | .13 | 1 | .72 | 1.10 |

*$p < .05$

Table 3. *Severity of Maltreatment and Opioid Misuse*

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Physical abuse | .03 | .07 | .12 | 1 | .73 | 1.03 |
| Emotional abuse | .03 | .04 | .61 | 1 | .44 | 1.21 |
| Sexual abuse | .19 | .10 | 3.42 | 1 | .06 | 1.21 |
| Neglect | .04 | .06 | .38 | 1 | .38 | 1.04 |

*$p < .05$

Table 4. *Presence of Sexual Abuse versus Other Maltreatment Subtypes*

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Minority status | -1.27 | .67 | 3.5 | 1 | .06 | .28 |
| Age | .14 | .06 | 5.10 | 1 | .02* | 1.15 |
| Physical abuse | .08 | .61 | .02 | 1 | .90 | 1.09 |
| Neglect | .07 | .38 | .04 | 1 | .85 | 1.08 |
| Emotional abuse | -.23 | .39 | .33 | 1 | .56 | .80 |
| Sexual abuse | 1.25 | .59 | 4.44 | 1 | .04* | 3.50 |
| Constant | -3.37 | 1.69 | 3.99 | 1 | .05* | .03 |

*$p < .05$

Table 5. *Severity of Sexual Abuse versus Other Maltreatment Subtypes*

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Minority status | -1.25 | .67 | 3.49 | 1 | .06 | .29 |
| Age | .13 | .06 | 5.06 | 1 | .02* | 1.15 |
| Physical abuse | -.09 | .12 | .61 | 1 | .43 | .91 |
| Neglect | .02 | .07 | .10 | 1 | .74 | 1.02 |
| Emotional abuse | -.02 | .08 | .07 | 1 | .79 | .98 |
| Sexual abuse | .24 | .13 | 3.31 | 1 | .07 | 1.27 |
| Constant | -3.16 | 1.62 | 3.80 | 1 | .05 | .04 |

*$p < .05$

Table 6. *Sexual Abuse, Perceived Stress, and Opioid Misuse*

| | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|
| Minority status | -1.18 | .71 | 2.76 | 1 | .10 | .309 |
| Age | .16 | .07 | 6.45 | 1 | .01* | 1.178 |
| Perceived stress | .05 | .03 | 2.85 | 1 | .09 | 1.049 |
| Sexual abuse | -.50 | 1.33 | .14 | 1 | .71 | .605 |
| Perceived stress X sexual abuse | .08 | .07 | 1.26 | 1 | .26 | 1.085 |
| Constant | -4.95 | 1.87 | 6.99 | 1 | .01* | .007 |

*$p < .05$

## Vita

Stephanie Kors obtained her Bachelor of Science in Psychology at the University of Georgia in 2015. She obtained her Masters of Science in Psychology at the University of Tennessee in 2017 and plans to complete her PhD in 2021. Her research interests include developmental psychopathology, risk and resilience among high-risk populations, and public policy.